ELECTRONIC INDUSTRIES and
(January to July)

The Electronic Engineer magazines
(August to December)

1966 Annual editorial index

Issue index

January

	Page
1966 Review & Forecast for the Electronic Industries ..Robert J. Bramlett & Edward G. Shaud	36
A Practical Infrared T.V. System..... D. Buhl & L. Spinazzi	48
High Resolution Star Tracking .....S. Malkiel	54
Exotic Devices of the Future, R. Glasgal	59
1966 Survey of Potentiometer Specifications—Part 3: Trimmer Potentiometers .....Staff Report	62
Measuring Radar Sensitivity .....G. F. Andrews	94
Communications—Past, Present & Future	102
Editorial: Who Will Champion the Engineer in 1966	132

February

Studying & Controlling IC Reliability ....H. T. Go	40
High-Efficiency Power Supply Uses Micrologic S. A. Schwartz	46
Understanding the Tunnelling Phenomenon..... C. K. Adams & I. Dlugatch	52
Precise Voltage Regulation for Photomultipliers E. Bauman	57
1966 Survey of Switch Specifications—Part II Pushbutton Switches	61
Advances in Storage Oscilloscopes ....D. C. Calnon	109
Is EIA/JEDEC Device Registration Useful? ..... S. Feldman	116
Editorial: What Future for Passive Components?	140

March

EI's Synchro Reference Guide	33
How Long-Term Storage Affects Reliability ..... R. F. Ficchi	42
Analog Applications of Microelectronics ..... R. E. Samuelson	54
Transistor in Avalanche Mode Generates Microwaves .....E. W. Hoffman & T. K. Ishii	60
1966 Survey of Potentiometer Specifications—Part 4: General-Purpose Potentiometers	64
Matrix Algebra Analyzes Transistor Feedback Amplifiers .....A. S. Audeh	67
Using Photomultipliers for Laser Ranging ..... J. Rogers	72
Non-Destructive Screen Test for Components .... G. W. Carter	74
Challenges of Electronic Consulting ..S. Feldman	94
Analyzing Probability Distribution in Real Time M. Kaufman & P. Schaten	152
Measuring Phase Digitally .....W. G. Howard	161
Editorial: More Security for Electronic Engineers	190

April

EI's IC Course—Part 1: The Importance of Integrated Circuits Yield .....J. Jolly	39
Display and Storage Tubes—Where They Are Today .....M. D. Harsh	54
Improving the Information Flow Rate Between Man and Machine .....C. Halstead	62
Microelectronics and Reliability Assessment ..... J. B. Brauer	67
A Guide to Selecting Technical Ceramics ..... G. I. Schmidhammer	72
1966 Survey of Switch Specifications—Part 3: Manual Rotary Switches	77
Calibrating Wheatstone Bridges .....A. Gellert	90
Why, What, How of the Engineer's Files ..... L. L. Grinius	138
Editorial: Fabrication Design—New Key to Electronic Futures	152

May

EI's IC Course—Part 2: Removing the Mystery from IC Processing ....D. B. Kret, et al	43
A Look at Light Sensitive Imaging Tubes ..... I. T. Saldi, et al	66
The Radioisotope Thermoelectric Generator ..... R. J. Campana	82
Engineer's Notebook #81—Converting Natural Binary Encoder Readout .....P. E. Green	86
Guidelines for the Design Review of Circuits..... J. Engleman	88
Engineer's Notebook #82—A Quick Estimate of Stability .....A. T. Moses	91
New Developments in Solid State AC Power Conversion .....R. D. Hallock	92
Power Supply Application Notes .....Staff Report	95
Measuring Power Supply Performance ..... Staff Report	98
New Power Supply Literature	103
Percent Regulation of a Power Supply (Nomograph .....R. Graf	111
1966 Switch Survey—Part 4: Basic Switches—Precision Snap Action, Stack Reed ..... Staff Report	112
Current Integrating or Charge Measuring Considerations .....R. S. Schreiner	146
Help Yourself to Financial Security ..S. Feldman	162
Educational Needs of Seasoned Engineers ..... S. S. Dubin	166
Editorial: A "Hot Line" for World Peace?	176

June

EI's IC Course—Part 3: Photo Masks..The Tooling for ICs..F. H. Bower & H. K. Dicken	41
A New Method for Predicting Reliability ..... E. J. Dworkin & R. P. Misra	54
Communication Between Two Asynchronous Systems .....A. P. Cox & R. H. Sapp	60
Engineer's Notebook #83—Converting Binary Readout to Degrees of Rotation ..P. E. Green	64
A Practical Method of Demonstrating Reliability E. D. Marmiol, et al	66
In-Plant Quality Assurance Management ..... W. J. O'Connell	72
1966 Switch Survey—Part 5: Limit & Mercury Switches	76
Contest Results—"Most Useful Article"	84
Precision Microwave Power Measurements—A Survey .....R. F. Schwartz	88
Technical Note—A Shortcut to Disseminating Information ..... D. E. Olson	139
Editorial: A Poor Buy	150

July

EI's IC Course—Part 4: Epitaxial Growth in IC Fabrication ....D. Thompson & H. K. Dicken	36
The Challenges of Industrial Radio Telemetry .... C. H. Hoeppner	48
Applying SCRs to Consumer Products ..... E. K. Howell & J. H. Galloway	52

An Approach to Microminiature Circuit Documentation ..... R. D. Strom 56
Design Shortcuts for AC Compensators ..... A. S. Audeh 58
1966 Switch Survey—Part 6: Pressure, Vacuum, Inertia Switches 62
Solid State Power Inverters Come of Age ..... G. Milton 82
Semi-Automatic Circuit Card & Module Testing T. A. Moilan 92
The Value of Patents to the Engineer ..A. Ratner 102
Editorial: "The Old Order Changeth . . ." 118

August

Test equipment reference chart .....Staff Report 17
Resonant silicon cantilever tunes ICs ..... Steve Scrupski 26
Professional information for a professional career Staff Report 33
Staying one-up .....John Hunter 34
Wire & cable reference chart .....Staff Report 41
Using Laplace transforms for transistor circuits Harold W. Wong 50
Microwaves power new motor system ..... R. C. Garnier & Dr. T. K. Ishii 54
Using spark gaps to protect components ..... Keith Olson 60
How to reform selenium rectifiers..Frank Brunetto 64
Displaying MOS-FET characteristics ..... Russell Walton 66
Packaging integrated Circuits for short runs ..... Richard L. Dargis 74
Poor QC yields bad ICs .....Joseph B. Brauer 78
1966 survey of switch specifications—part 7: R-F switches (mechanical) 149
What's wrong with trade shows? ..John J. Hunter 156
Can't go to WESCON? .....Staff Report 164

September

Computer automates IC production steps ..... Steve Scrupski 24
A five-year degree? .....Alberto Socolovsky 33
When algebra fails, how do you find roots? 50
Varactors and frequency multipliers ..... Anatol Zverev 54
Sync generator has adjustable interlace ..... Alfred Scipione 64
Six measurements that open a Wheatstone bridge Samuel S. Tobe 68
Thirteen rules to package accessibility ..... Edmund Roberts 80
Shielding R-F with copper foils ..Norman H. Cale 86
Hybrid circuits in computer design ..... Joseph Karew & Thomas Gilligan 90
Potentiometers are simple, but ..... James A. Cunningham 112

October

LSI in practice .....Steve Scrupski 23
Removing redundancies saves spacecraft power Staff Report 24
ICs and You 30
Finding equations to fit empirical data ..... I. Stanley Rubin 46
The effect of active failures on reliability ..... Raymond Goldstein 50
Lightning discharges and your equipment ..... E. B. Arrowsmith 54
IC Course Part 6—Assembling integrated circuits H. K. Dicken & D. B. Kret 66
IC Course Part 7—Should you make your own ICs? D. B. Kret & Glen R. Madland 74
IC Course Part 8—What about linear integrated circuits? .....R. L. Harley & G. R. Madland 82
IC Course Part 9—Selecting ICs and suppliers ... J. B. Jolly & D. B. Kret 88
IC Course Part 10—The future of integrated circuits .....G. R. Madland & D. B. Kret 95
Dynamic testing of ICs 108
What is practical with complex integrated .... circuits .....J. W. Martin 118
Shrink packaging protects PC boards ..... Steve Scrupski 135

November

60 years 11
Laser measures fluid flow .....Smedley B. Ruth 23
Solid state TV camera eliminates vidicon tube Smedley B. Ruth 24
Ahoy satellite 26
Bandwidth and distortion in pulse filters ..... Gary B. Jordan 60
Advances in miniaturized microwave solid-state receivers .....W. P. Stearns 66
Circular slide rule for VSWR and peak power .... V. Sanford & L. A. Fasano 76
IC eliminates contact-bounce effects ..... Raymond B. Sepe 86
Nomogram solves radar range equation ..... William C. Morchin 91
Scanning and plotting the spectrum for EMC .... Staff Report 96
What makes a coax connector perform at microwaves 110
Microwave circuits: are they ready for integration? 116
Why tropo? .....Jack Hickey 166

December

Page
Get closer to the computer 11
Computer process brightens moon pictures..... Smedley B. Ruth 23
An active information system ....Emerson Clarke 29
Fortran primer for electronic engineers..... Alberto Socolovsky 50
How to predict servo positioner performance.... John R. Pivnichny 55
A universal BCD decoders ..James J. Klinikowski 60
Testing with tone-burst signals ..James K. Skilling 66
Backplane wiring by computer ..Smedley B. Ruth 78
Mesa Isolation .....Bert L. Frescura 84
Special report: computers for the electronic engineer—
Desk top computers .....Merrill Jackson 122
Small digital computers ....Alberto Socolovsky 124
Time-sharing .....J. E. Brammer 126
Analog computers .....Steve Scrupski 129

Subject index

ANNUAL FORECAST Month & Page No.

1966 Review and forecast in the ELECTRONIC INDUSTRIES R. J. Bramlett & E. G. Shaud, Jr. 1-36

CAREERS

An active information system ...Emerson Clarke 12-29
A five-year degree? 9-33
Educational needs of seasoned engineers ..... Dr. Samuel S. Rubin 5-166
Is microwave a good career for EEs? 11-30
Professional information for a professional career. 8-33

CERAMICS

A guide to selecting technical ceramics ..... G. I. Schmidhammer 4-72

CIRCUITS

#82 A quick estimate of stability ..... Arden T. Moses 5-91
A universal BCD decoders ..James J. Klinikowski 12-60
Design shorcuts for ac compensators ..... Azmi S. Audeh 7-58
Hybrid circuits in computer design ..... Joseph Karew & Thomas Gilligan 9-90
Guidelines for the design review of circuits ..... Jay Engleman 5-88
IC eliminates contact-bounce effects 11-86
Lightning discharges and your equipment ..... Elden B. Arrowsmith 10-54
Matrix algebra analyzes transistor feedback amplifiers 3-67
Measuring phase digitally .William G. Howard, Jr. 3-161
Solid state power inverters come of age ..... Gary Milton 7-82
Solid state TV camera eliminates vidicon tube .... Smedley B. Ruth 11-24
The effect of active failures on reliability 10-50
Using Laplace transforms for transistor circuits .. Harold W. Wong 8-50
When algebra fails how do you find roots? 9-50

COMMUNICATIONS

Communications—past, present & future 1-102

COMPUTERS

A universal BCD decoders ..James J. Klinikowski 12-60
A practical method of demonstrating reliability .. E. D. Karmiol, et al 6-66

Backplane wiring by computer ..Smedley B. Ruth 12-78
Communication between two asynchronous systems P. Cox, Jr. & R. H. Sapp 6-60
Computer automates IC production steps 9-24
Fortran primer for electronic engineers ..... Alberto Socolovsky 12-50
How to predict servo positioner performance ..... John R. Pivnichny 12-55
Hybrid circuits in computer design ..... Joseph Karew & Thomas Giiligan 9-90
Improving the information flow rate between man and machine .....Charles Halsted 4-62
New form of English for computers 8-28
Semi-automatic circuit card & module testing ... T. A. Moilan 7-92
Special report: Computers for the electronic—engineer
Analog computers .....Steve Scrupski 12-129
Desk top computers .....Merrill Jackson 12-122
Small digital cmoputers .....Alberto Socolovsky 12-124
Time-sharing .....J. E. Brammer 12-126
What is practical with complex integrated circuits J. W. Martin 10-118

CONSULTING ENGINEERS

Challenges of electronic consulting 3-94

CONSUMER ELECTRONICS

Applying SCRs to consumer products ..... E. K. Howell & J. H. Galloway 7-52

DISPLAYS

Display and storage tubes .....M. D. Harsh 4-54
High resolution star tracking ..... Saul Malkiel & Thomas Baasch
Improving the information flow rate between man and machine .....Charles Halsted 4-62
Light sensitive imaging tubes .I. T. Saldi, et al 5-67

ELECTRON TUBES

Display and storage tubes .....M. D. Harsh 4-54
Light sensitive imaging tubes .I. T. Saldi, et al 5-67
Precise voltage regulation for photomultipliers .. Edward Bauman 2-57
Using photomultipliers for laser ranging ..... Jack Rogers 3-72

ENGINEERING FILES

An approach to microminature circuit documentation .....Ronald D. Strom 7-56
A shortcut to disseminating information ..... Dewey E. Olson 6-139
Why what how of the engineer's files ..... Leo L. Grinius 4-138

FERRITES

Ceramic magnet insulates, blows arc 9-22
. . . Exotic devices of the future? 1-59

FILTERS

Bandwidth and distortion in pulse filters ..... G. B. Jordan 11-60

INFRARED

A practical infrared TV system 1-48

INSTRUMENTS

Calibrating wheatstone bridges .....A. Gellert 4-90
Circular slide rule for VSWR and peak power 11-76
Current integrating or charge measuring considerations .....Robert S. Schreiner 5-146
Displaying MOS-FET characteristics Russell Walton 8-66
Dynamic testing of ICs 10-108
Scanning and plotting the spectrum for EMC 11-96
Measuring phase digitally..William G. Howard, Jr. 3-161
Measuring power supply performance 5-98
New dimension in r-f analyzers 4-102
Non-destructive screening test for components.... Glenn W. Carter 3-74
Precision microwave power measurements ..... A survey .....R. F. Schwartz 6-88
Precision wattmeter 4-102
Semi-automatic circuit card & module testing .... T. A. Moilan 7-92

Six measurements that open a Wheatstone bridge Samuel S. Tobe 9-68
Storage oscilloscopes .....Donald C. Calnon 2-109
Test equipment reference chart 8-17
Testing with tone-burst signals..James K. Skilling 12-66

INTEGRATED CIRCUITS

Advances in miniaturized microwave solid-state receivers .....W. P. Stearns 11-66
Analog applications of microelectronics ..... Dr. Robert E. Samuelson 3-54
An approach to microminiature circuit documentation .....R. D. Strom 7-56
Computer automates IC production steps 9-24
Dynamic testing of ICs 10-108
High-efficiency power supply uses micrologic .... Samuel A. Schartz 2-46
Hybrid circuits in computer design..Joseph Karew & Thomas Gilligan 9-90
IC eliminates contact-bounce effects ..... Raymond B. Sepe 11-86
ICs and You 10-30

Integrated circuits course
Part 1: The importance of integrated circuits yield to engineers 4-40
Glen R. Madland & Jon Jolly 8-88
Part 2: Removing the Mystery from IC Processing .....D. B. Kret, et al 5-43 8-95
Part 3: Photo Masks....The Tooling for ICs Frank H. Bower & Howard K. Dicken 6-41 8-103
Part 4: Epitaxial growth in IC fabrication D. Thompson & H. K. Dicken..... 7-36 8-116
Part 5: New techniques of breadboarding.. H. K. Dicken & F. H. Bower 8-126
Part 6: Assembling integrated circuits ..... H. K. Dicken & D. B. Kret 10-66
Part 7: Should you make your own ICs? .... D. B. Kret & G. R. Madland 10-74
Part 8: What about linear integrated circuits R. L. Hartley & G. R. Madland 10-82
Part 9: Selecting ICs and suppliers ..... J. B. Jolly & D. B. Kret 10-88
Part 10: The future of integrated circuits ..... G. R. Madland & D. B. Kret 10-95
LSI in practice .....Steve Scrupski 10-23
Mesa isolation .....Bert L. Frescura 12-84
Microcircuit package case doubles as heat-sink 9-88
Microelectronics and reliability assessment ..... Joseph B. Brauer 4-67
Microwave circuits: are they ready for integration? 11-116
Packaging integrated circuits for short runs ..... Richard L. Dargis 8-74
Plastic-Pack ICs herald 50-cent circuits 8-27
Poor QC yields bad ICs .....Joseph H. Brauer 8-78
Resonant silicon cantilever tunes ICs ..... Steve Scrupski 8-26
Solid state TV camera eliminates vidicon tube .... Smedley B. Ruth 11-24
Studying and controlling IC reliability ..H. T. Go 2-41
Thin-film dc transformer 3-107
What is practical with complex integrated circuits? J. W. Martin 10-118

LASERS

Laser measures fluid flow .....Smedley B. Ruth 11-23
Using photomultipliers for laser ranging ..... Jack Rogers 3-72

MATHEMATICAL TOOLS

Bandwidth and distortion in pulse filters ..... Gary B. Jordan 11-60
Finding equations to fit empirical data ..... Stanley Rubin 10-46
When algebra fails how do you find roots? 9-50

MICROWAVES

Big YIG crystals 8-29
Communications—past, present & future 1-102
GaAs Gunn-effect oscillators 9-26
Measuring radar system sensitivity ..... George F. Andrews 1-94
Microwaves power new motor system ..... R. C. Garnier & Dr. T. K. Ishii 8-54
Precision microwave power measurements A survey R. F. Schwartz 6-88
Transistor in avalanche mode generates microwaves E. W. Hoffman & T. K. Ishii 3-60
Varactors and frequency multipliers 9-54
Advances in miniaturized microwave solid-state receivers .....W. P. Stearns 11-66
Bandwidth and distortion in pulse filters ..... Gary B. Jordan 11-60
Circular slide rule for VSWR and peak power .... V. Sanford & L. A. Fasano 11-76

Is microwave a good career for EEs? 11-30
Microwave circuits: are they ready for integration
S. E. Scrupski 11-116
Nomogram solves radar range equation 11-91
Why tropo? 11-166
What makes a coax connector perform at microwaves? .....T. N. Anderson 11-110

NOMOGRAPH, CHARTS & TABLES

#83 converting natural bimary encoder readout to decimal degrees of rotation ....Paul E. Green 6-64
#81 converting natural encoder readout to degrees, minutes and seconds 5-86
Nomograph of voltage drop across load supply leads 5-99
Nomograph solves radar range equation .....
W. C. Morchin 11-91
Percent regulation of a power supply .....
Rudolf F. Graf 5-111
Test equipment reference chart 8-17
Wire & cable reference chart 8-41

OPERATIONAL AMPLIFIERS

Current integrating or charge measuring considerations .....R. S. Schreiner 5-146

PACKAGING

A guide to selecting technical ceramics .....
G. I. Schmidhammer 4-72
Backplane wiring by computer ..Smedley B. Ruth 12-78
Hybrid circuits in computer design .....
Joseph Karew & Thomas Gilligan 9-90
Microcircuit package case doubles as heat-sink ... 9-88
New approach to multilayer interconnections 4-98
Packaging integrated circuits for short runs .....
Richard L. Dargis 8-74
Shrink packaging protects PC boards .....
Steve Scrupski 10-135
Thirteen rules to package accessibility .....
Edmund Roberts 9-80
How to reform selenium rectifiers..Frank Brunetto 8-64
Potentiometers are simple, but .....
James A. Cunningham 9-112
What makes a coax connector perform at microwaves? .....T. N. Anderson 11-110

PATENTS

The value of patents to the engineer .....
Allan Ratner 7-102

POTENTIOMETERS

1966 Survey of potentiometer specifications:
Part 3: Trimmer potentiometers 1-62
Part 4: General-purpose potentiometers 3-64

POWER SUPPLIES

Application notes 5-95
High-efficiency power supply uses micrologic .....
Samuel A. Schwartz 2-46
Measuring power supply performance 5-98
Nomograph of voltage drop across load supply ... leads 5-99
Non-destructive screening test for components ..
Glenn W. Carter 3-74
Percent regulation of a power supply .....
Rudolf F. Graf 5-111
Potentiometers are simple, but .....
James A. Cunningham 9-112
Precise voltage regulation for photomultipliers ...
Edward Bauman 2-57
Solid-state ac power conversion..Robert D. Hallock 5-92
Solid-state power inverters come of age .....
Gary Milton 7-82
The radioisotope thermoelectric generator .....
R. J. Campana 5-82

QUALITY CONTROL

Analyzing probability distribution in real time
M. Kaufman & P. Schatten 3-152
In-plant quality assurance management .....
William J. O'Connell 6-72
Poor QC yields bad IC's 8-78

REDUNDANCY

Removing redundancies saves spacecraft power ... 10-24

RELIABILITY

The effect of active failures on reliability 10-50
A new method for predicting reliability .....
E. J. Dworkin & Dr. R. P. Misra 6-54
A practical method of demonstrating reliability
E. D. Karmiol, et al 6-66
How long-term storage affects reliability .....
Rocco F. Ficchi 3-42
Microelectronics and reliability assessment .....
Joseph B. Brauer 4-67
Non-destructive screening test for components ...
Glenn W. Carter 3-74
Poor QC yields bad IC's .....Joseph H. Brauer 8-78
Reliability test system 1-65
Studying and controlling IC reliability. H. T. Go .. 2-41

SATELLITES

Communications—past, present & future 1-102
High resolution star tracking .....
Saul Malkiel & Thomas Baasch 1-54
Removing redundancies saves spacecraft power ... 10-24

SEMICONDUCTORS

Applying SCRs to consumer products
E. K. Howell & J. H. Galloway 7-52
Displaying MOS-FET characteristics 8-66
... Exotic devices of the future? ..Ralph Glasgal 1-59
GaAs Gunn-effect oscillators 9-26
Transistor in avalanche mode generates microwaves
T. K. Ishii 3-60
Tunnelling phenomenon .....Charles K. Adams 2-52
Varactors and frequency multipliers .....
Anatol Zverev 9-54

SERVOMECHANISMS

Design shortcuts for ac compensators .....
Azmi S. Audeh 7-58
How to predict servo positioner performance .....
John R. Pivnichny 12-55
#81—Converting natural encoder readout to degrees, minutes and seconds 5-86
#82—A quick estimate of stability .....
Arden T. Moses 5-91
#83—Converting natural binary encoder readout to decimal degrees of rotation 6-64

SHIELDING

Shielding r-f with copper foils ....Norman H. Cale 9-86

SHOWS AND CONVENTIONS

Can't go to WESCON? 8-164
What's wrong with trade shows ....John Hunter 8-156

STANDARDS

Is EIA/JEDEC device registration useful? 2-116

SUPERCONDUCTORS

... Exotic devices of the future? 1-59

SWITCHES

1966 Survey of switch specifications—
Part 2: Pushbutton switches 2-61
Part 3: Manual rotary switches 4-77
Part 4: Basic switches—precision snap action, stack, reed 5-112
Part 5: Limit switches; mercury switches; foot switches 6-76
Part 6: Pressure, vacuum inertia switches 7-62
Part 7: R-F switches (mechanical) 8-149

TELEMETRY

Removing redundancies saves spacecraft power ... 9-24
The challenges of industrial radio telemetry .....
Conrad H. Hoeppner 7-48

TELEVISION

A practical infrared TV system .....
David Buhl & Larry Spinazze 1-48
Removing redundancies saves spacecraft power.... 10-24
Solid-state TV camera eliminates vidicon tubes ...
Smedley B. Ruth 11-24

TRANSDUCERS

Don't swallow your dental transducer 10-26

WHEATSTONE

Calibrating Wheatstone bridges .....A. Gellert 4-90
Six measurements that open a Wheatstone bridge
Samuel S. Tobe 9-68

WIRES AND CABLES

Nomograph of voltage drop across load supply leads 5-99
Wire and cable reference chart 8-41

Printed in USA